

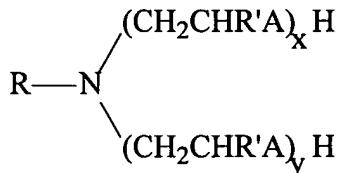
## 1     **WHAT IS CLAIMED IS:**

2 1. A method of electrically logging a subterranean well, the method comprising:

3 a) drilling the subterranean well with an invert emulsion drilling fluid,

4 wherein said fluid includes: an oleaginous fluid; a non-oleaginous fluid; and an amine

5 surfactant having the structure



wherein R is a C<sub>12</sub>-C<sub>22</sub> aliphatic hydrocarbon; R' is an independently selectable from hydrogen or C<sub>1</sub> to C<sub>3</sub> alkyl; A is NH or O, and 1 ≤ x+y ≤ 3;

- b) adding acid to the invert emulsion drilling fluid in a sufficient amount to reverse the filtercake solids from being oil-wet to being water-wet; and
- c) electrically logging said well.

15 2. The method of claim 1 wherein said oleaginous fluid comprising from 5 to about  
16 100% by volume of the oleaginous fluid of a material selected from a group consisting of  
17 esters, ethers, acetals, di-alkylcarbonates, hydrocarbons, and combinations thereof.

19 3. The method of claim 1 wherein said non-oleaginous liquid is an aqueous liquid.

21 4. The method of claim 3 wherein said aqueous liquid is selected from the group  
22 consisting of sea water, a brine containing organic or inorganic dissolved salts, a liquid  
23 containing water-miscible organic compounds, and combinations thereof.

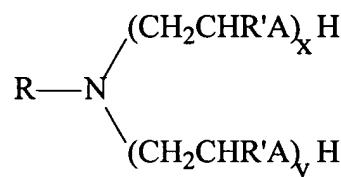
25 5. The method of claim 1 wherein said amine surfactant is selected from  
26 diethoxylated tallow amine; diethoxylated soya amine; N-aliphatic-1,3-diaminopropane  
27 wherein the aliphatic group is a C<sub>12</sub> to C<sub>22</sub> hydrocarbon; or combinations thereof.

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2 6. A method of gravel packing a downhole area of a subterranean well, said method  
3 comprising:

4 a) forming a mixture of a gravel packing material and an invert emulsion  
5 drilling fluid, wherein said fluid includes: an oleaginous fluid; a non-oleaginous fluid; an  
6 amine surfactant having the structure

7



10 wherein R is a C<sub>12</sub>-C<sub>22</sub> aliphatic hydrocarbon; R' is an independently  
11 selectable from hydrogen or C<sub>1</sub> to C<sub>3</sub> alkyl; A is NH or O, and 1 ≤ x+y ≤ 3;

12 b) injecting said mixture of gravel packing material and invert emulsion into  
13 a subterranean well so as to gravel pack the downhole area ; and  
14 c) adding acid to said fluid so as to change the oil-wet gravel packing  
15 materials into water-wet gravel packing materials and;  
16 d) washing said well with an aqueous based wash solution.

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18 7. The method of claim 6 wherein said oleaginous fluid comprising from 5 to about  
19 100% by volume of the oleaginous fluid of a material selected from a group consisting of  
20 esters, ethers, acetals, di-alkylcarbonates, hydrocarbons, and combinations thereof.

21

22 8. The method of claim 6 wherein said non-oleaginous liquid is an aqueous liquid.

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24 9. The method of claim 8 wherein said aqueous liquid is selected from the group  
25 consisting of sea water, a brine containing organic or inorganic dissolved salts, a liquid  
26 containing water-miscible organic compounds, and combinations thereof.

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1 14. The method of claim 13 wherein said aqueous liquid is selected from the group  
2 consisting of sea water, a brine containing organic or inorganic dissolved salts, a liquid  
3 containing water-miscible organic compounds, and combinations thereof.

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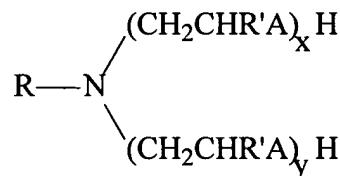
5 15. The method of claim 11 wherein said amine surfactant is selected from  
6 diethoxylated tallow amine; diethoxylated soya amine; N-aliphatic-1,3-diaminopropane  
7 wherein the aliphatic group is a C<sub>12</sub> to C<sub>22</sub> hydrocarbon; or combinations thereof.

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9 16. A method of fracturing a subterranean formation, the subterranean formation  
10 being in fluid communication with the surface via a well, the method comprising:

11 a) injecting a fracturing fluid into said well, wherein said fracturing fluid includes:  
12 an oleaginous fluid; and an amine surfactant having the structure

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wherein R is a C<sub>12</sub>-C<sub>22</sub> aliphatic hydrocarbon; R' is an independently selectable from hydrogen or C<sub>1</sub> to C<sub>3</sub> alkyl; A is NH or O, and 1 ≤ x+y ≤ 3; and oil-wet propant material;

b) pressurizing said fluid so as to cause the subterranean formation to fracture and allow the propant materials to enter said crack;

c) adding acid to said fluid so as to change the oil-wet propant materials into water-wet propant materials and;

d) washing said well with an aqueous based wash solution.

1       17. The method of claim 16 wherein said oleaginous fluid comprising from 5 to about  
2       100% by volume of the oleaginous fluid of a material selected from a group consisting of  
3       esters, ethers, acetals, di-alkylcarbonates, hydrocarbons, and combinations thereof.

4

5       18. The method of claim 16 wherein the fracturing fluid further includes a non-  
6       oleaginous liquid.

7

8       19. The method of claim 18 wherein said non-oleaginous liquid is selected from the  
9       group consisting of sea water, a brine containing organic or inorganic dissolved salts, a  
10       liquid containing water-miscible organic compounds, and combinations thereof.

11

12       20. The method of claim 16 wherein said amine surfactant is selected from  
13       diethoxylated tallow amine; diethoxylated soya amine; N-aliphatic-1,3-diaminopropane  
14       wherein the aliphatic group is a C<sub>12</sub> to C<sub>22</sub> hydrocarbon; or combinations thereof.

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16       21. The method of claim 16 wherein the proppant material is selected from the group  
17       consisting of quartz gravel, sand, glass beads, ceramic pellets, and combinations thereof.

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*Add  
a'*